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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/811,622

03/29/2004

Timothy Mace

03050US

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61611

7590

07/18/2006

ROHM AND HAAS ELECTRONIC MATERIALS
CMP HOLDINGS, INC.
451 BELLEVUE ROAD
NEWARK, DE 19713

EXAMINER

GEORGE, PATRICIA ANN

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 07/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/811,622

Applicant(s)

MACE ET AL.

Examiner

Patricia A. George

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5-9-06.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

35 USC 112 rejection of claim 4 withdrawn, as amendments filed 5/9/2006 have placed the claim proper form.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, and 3-6 are rejected under 35 U.S.C. 102(b)/103(a) as being disclosed by Yano et al of USPN 6,454,819.

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Yano discloses an aqueous composition used for manufacture of various semiconductor device (col.1, l.27-28) including films of (col.12, l.56) tungsten (col.12, l.col.12, l.61) or titanium (col.12, l.65) comprising: 5 wt% fumed silica abrasives commonly known and available by the trade name of Aerosil #90, a product of Nihon Aerosil Co., Ltd. (col.18, l.2-5) which is labeled by the size of the surface area and in this case the name indicates a surface area of greater than 90m.sup.2/g (evidenced by the manufactures' trade product description: Aerosil ® 90, enclosed); 0.1-15% oxidizing agents(col.11, l.1); 0.01-5% chelating agents (col.11, l.27-29); water (col.24, l.63); and 0.1-10.0% organic or inorganic acids (col.11, l.48-49) that are complexing agents used to improve the polishing rate (col.11, l.32).

The disclosure of acid in the slurry solution is considered to read on applicant's limitation of "has only been exposed to an acidic pH."

It is noted that Yano fails to disclose that the fumed silica was produced by a method involving entirely dispersed and diluting the silica in an acidic pH. However, such limitations are considered to be product by process limitations which do not further limit the fumed silica in this case because applicants have not shown that the final fumed silica has different properties than that disclosed by Yano. As a result, the disclosed fumed silica anticipates applicants' claims because it is essentially the same composition. In the alternative, It would have been obvious to one of ordinary skill in the art at the time of invention was made, to employ fumed silica with a surface area of greater than 90 m²/g made by any method including that disclosed by applicants

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because the final composition has the same physical characteristics despite the method by which it was made.

As for claim 3 wherein the oxidizer is an iodate, Yano specifically mentions potassium iodate and the like in column 10, line 56.

As for claim 4, Yano discloses the use of phosphoric acid or the like in column 12, line 46.

As for claim 5, Yano discloses no restrictions as to chelating agents (col.11, line 10-11) including use of many types of carboxylic acid containing compounds such as glutamic acid (col.11, l.32-42).

As for claim 6, Yano discloses the pH of an aqueous composition is preferably determined as appropriate in consideration of the working surface, (col.12, l.52-52) and goes on to teach examples 6b-10B which all have a pH of 3.5, as claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al of USPN 6,454,819 (see above) in view of Degussa (sales brochure for Hydrophilic Fumed Silicas).

Although Yano clearly teaches use of Aerosal ® 90 abrasives (prepared in acid), Yano does not teach the use of 130 m.sup.2/g abrasives, as in claim 2.

The company, Degussa, widely advertises and makes help readily available for use of abrasives with surface areas of greater than 130 m.sup.2/g.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to use CMP abrasives with surface areas of greater than 130 m.sup.2/g, as Degussa's, in a CMP slurry, such as Yano's, because they are advertised and readily available.

Claim Rejections - 35 USC § 103

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al of USPN 6,454,819 (see above) in view of Misra et al. of USPN 6,530,967.

Yano teaches tungsten CMP slurry with organic peroxides (col.10, l.51) are combined with organic acids, such as lactic acid in quantities of 0.01-5% (col.11, 28-38).

Yano does not teach use of potassium pyrophosphate.

Misra et al teaches the use of potassium pyrophosphate as a stabilizer for the peroxide in tungsten CMP slurry. Misra teaches the amount of the stabilizer may vary to provide better stabilization (col.6, l.29-31), and also cites 0.1%, as claimed (see figure 5).

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It would have been obvious to one of ordinary skill in the art at the time of invention was made, to include potassium pyrophosphate as a stabilizer in the CMP slurry disclosed by Yano, because Misra teaches it will reduce the decomposition of the peroxygen compound in the slurry composition.

Claim Rejections - 35 USC § 103

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al of USPN 6,454,819 and Misra et al. of USPN 6471745, see discussion above, in view of Degussa (sales brochure for Hydrophilic Fumed Silicas).

As for claim 8, see discussion above on surface area of abrasives, toward applicants' claim 2.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to use CMP abrasives with surface areas of greater than 130 m.sup.2/g, as Degussa's, in a CMP slurry, such as Yano's, because they are advertised and readily available.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1-6 rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al of USPN 6,454,819, in view of Tamai et al. (herein referred to as Tamai) (6,248,144).

As for claims 1 and 2, Yano discloses an aqueous composition used for manufacture of various semiconductor device (col.1, l.27-28) including films of (col.12, l.56) tungsten (col.12, l.col.12, l.61) or titanium (col.12, l.65) comprising: 5 wt% fumed silica abrasives; 0.1-15% oxidizing agents(col.11, l.1); 0.01-5% chelating agents (col.11, l.27-29); water (col.24, l.63); and 0.1-10.0% organic or inorganic acids (col.11, l.48-49) that are complexing agents used to improve the polishing rate (col.11, l.32).

Although Yano clearly teaches use of 90 m.sup.2/g abrasives, as in claim 1, Yano fails to teach use of 130 m.sup.2/g abrasives, as in claim 2, and that the fumed silica has been entirely dispersed and diluted in an acidic pH.

The reference of Tamai teaches a composition of fumed silica, in a variety of surface areas including greater than 90 and 130 m.sup.2/g fumed silica, as in applicants claims 1 and 2 (see Table 1). Tamai also teaches a composition that shows long time stable dispersion of fumed silica (i.e. entirely) which is added (i.e. diluted) in an acidic pH (col.5, lines 9-10), as in claim 1.

It would have been obvious to one of ordinary skill in the art at the time of invention was made, to include fumed silica that is dispersed and diluted in an acidic pH, as Tamai, when making the polishing composition of Yano, because Tami teaches the composition is stable for a long time, which is a cost savings to industry.

As for claim 3 wherein the oxidizer is an iodate, Yano specifically mentions potassium iodate and the like in column 10, line 56.

As for claim 4, Yano discloses the use of phosphoric acid or the like in column 12, line 46.

As for claim 5, Yano discloses no restrictions as to chelating agents (col.11, line 10-11) including use of many types of carboxylic acid containing compounds such as glutamic acid (col.11, l.32-42).

As for claim 6, Yano discloses the pH of an aqueous composition is preferably determined as appropriate in consideration of the working surface, (col.12, l.52-52) and goes on to teach examples 6b-10B which all have a pH of 3.5, as claimed.

Claim Rejections - 35 USC § 103

Claims 7-8 rejected under 35 U.S.C. 103(a) as being unpatentable over Yano et al of USPN 6,454,819, in view of Tamai, as applied to claims 1-6 above, further in view of Misra et al. of USPN 6,530,967.

Yano teaches tungsten CMP slurry with organic peroxides (col.10, l.51) are combined with organic acids, such as lactic acid in quantities of 0.01-5% (col.11, 28-38).

Yano does not teach use of potassium pyrophosphate.

Misra et al teaches the use of potassium pyrophosphate as a stabilizer for the peroxide in tungsten CMP slurry. Misra teaches the amount of the stabilizer may vary to provide better stabilization (col.6, l.29-31), and also cites 0.1%, as claimed (see figure 5).

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It would have been obvious to one of ordinary skill in the art at the time of invention was made, to include potassium pyrophosphate as a stabilizer in the CMP slurry disclosed by Yano, because Misra teaches it will reduce the decomposition of the peroxygen compound in the slurry composition.

As for claim 8, see discussion above on surface area of abrasives, toward applicants' claim 2 above.

Response to Arguments

Applicants' arguments, filed 5/9/2006, with respect to the method by which the fumed silica is produced are not persuasive because applicants have not shown that the fumed silica produced by the method defined in applicants' claims distinguish physically from that disclosed by Yano. A new rejection is set forth above to address applicants' newly added limitations.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patricia A. George whose telephone number is (571)272-5955. The examiner can normally be reached on weekdays between 7:00am and 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571)272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.


PAG
06/06

Patricia A George
Examiner
Art Unit 1765

NADINE NORTON
SUPERVISORY PATENT EXAMINER
ART UNIT 1765
